

1. A unit used to express the exposure an individual receives is the:
 - a. Rem/hr
 - b. Roentgen
 - c. Curie
 - d. Rad
2. The rem is a unit used to measure:
 - a. Radiation exposure
 - b. Radiation dose in terms of the amount of energy absorbed
 - c. Radiation dose in terms of the amount of the biological effect caused by the amount of energy absorbed
 - d. Radioactivity
3. Because of its low penetrating ability, the type of radiation which is usually only a hazard when inhaled or ingested is:
 - a. Alpha radiation
 - b. Beta radiation
 - c. Gamma radiation
 - d. Neutron radiation
4. Which of the following is an example of proper units for expressing exposure rate?
 - a. Hr/R
 - b. R/hr
 - c. Hr:R
 - d. r:hr
5. Cosmic radiation and radiation from terrestrial sources are examples of:
 - a. Natural background radiation
 - b. Natural man-made radiation
 - c. Industrial sources of radiation
 - d. Radioactive sources used in the medical field
6. An example of a man-made source of radiation is:
 - a. Terrestrial sources
 - b. Cosmic radiation
 - c. Diagnostic radiation
 - d. Potassium-40 in the human body
7. The three factors which are important in protecting individuals from radiation are:
 - a. Time, shielding, and dose rate
 - b. Dose rate, time, and gender
 - c. Time, shielding, and distance
 - d. Distance, time, and dose rate

8. Radiation received by the body over a short period is:
- a. Chronic exposure
 - b. Sublethal exposure
 - c. Acute exposure
 - d. Supralethal exposure
9. Chronic exposures are:
- a. Amounts of radiation received over a short period of time
 - b. Amounts of radiation received over a very long period of time
 - c. Acute exposures which affect only critical organs of the body
 - d. Acute exposures which affect all parts of the body
10. Radioactive decay is defined as:
- a. The decrease in the amount of any radioactive material due to the spontaneous emission of nuclear radiation from the nucleus
 - b. The decomposition of radioactive atoms due to lengthy exposure to direct sunlight
 - c. The gradual decrease in the number of radioactive atoms in radioactive material due to spontaneous fission
 - d. The decline in the strength of a radioactive source due to the combined effects of time, distance, and shielding
11. The key elements of emergency management are , Response, Recovery and, Mitigation.
- a. Removal
 - b. Preparedness
 - c. Measurement
 - d. Employment
12. The majority of radioactive material shipments are made in this type of packaging.
- a. Type A
 - b. Type B
 - c. Limited Quantity
 - d. Industrial
13. Type B packages must be able to meet Type A requirements and also withstand the effects of _____ conditions?
- a. Higher radiation
 - b. Accident
 - c. Higher weight
 - d. Faster transportation speed

14. The label required for radioactive material packages with a maximum dose rate of 200 mR/hr at the surface of the package is:

- a. Radioactive Yellow-II
- b. Radioactive Yellow III
- c. Radioactive White I

15. The label required for radioactive material packages in excess of 50 mr/hr but less than 200 mr/hr is:

- a. Radioactive Yellow-I
- b. Radioactive Yellow-II
- c. Radioactive Yellow-III

16. To determine the amount of radioactive material in a package of radioactive materials, you would look at the:

- a. Placard
- b. Label
- c. Package type

17. The distinctive symbol used to identify radioactive materials is the:

- a. Diamond
- b. Tri-blade
- c. White square

18. Unbroken radioactive material packages never have a surface radiation dose above this level:

- a. 50 mR/hr
- b. 100 mR/hr
- c. 500 mR/hr
- d. 1,000 mR/hr

19. A member of the public should give lifesaving first aid to injured victims of a radiological transportation accident:

- a. Without delay out of concern for radiological hazards
- b. After verifying that no radioactive material packages have broken open
- c. After isolating the area
- d. Immediately after notifying the appropriate authorities

20. In the United States, serious radiation exposures:

- a. Have not resulted from radiological transportation accidents due largely to the nature of the material transported and the use of appropriate protective packaging
- b. Have resulted from improper labeling of radioactive material shipments
- c. Have resulted from improper packaging of radioactive material shipments
- d. Frequently result from radioactive transportation accidents due to the large number of such shipments

21. In every nuclear power plant that generates electricity, the following components are present:
- a. Heat source, steam generator, cooling tower
 - b. Heat source, turbine electricity generator, and pump
 - c. Turbine electricity generator, pump, cooling tower
 - d. Pump, steam generator, cooling tower
22. A chain reaction results when a uranium atom is struck by a/an _____ released by a nearby Uranium atom undergoing fission.
- a. Electron
 - b. Proton
 - c. Gamma ray
 - d. Neutron
23. The three main barriers in a nuclear power plant to prevent release of fission products are the fuel rods, the reactor vessel, and the _____.
- a. Secondary coolant system
 - b. Containment building
 - c. Condensor
 - d. Control rods
24. To prevent fuel damage, decay heat must be removed from the reactor core:
- a. Until the reactor shuts down
 - b. After the reactor shuts down
 - c. Until the primary coolant system is activated
25. Control rods are used in a reactor core to:
- a. Absorb free neutrons
 - b. Are a source of free neutrons which are used to cause fission
 - c. Encase the nuclear fuel
26. In a pressurized water- reactor the primary cooling water:
- a. Boils in the core and is used to turn the turbine
 - b. Evaporates to the atmosphere using a cooling tower
 - c. Transfers its heat to the secondary cooling water in a steam generator
27. A large modern nuclear power plant has approximately fuel assemblies in its core.
- a. 100
 - b. 50
 - c. 200
 - d. 500

28. Nuclear power plant emergency plans are required to incorporate actions for which of the following types of radiological hazards?

- a. Direct exposure to radiation from a plume of radioactive material
- b. Blast effects
- c. Fallout

29. In a , a major failure has occurred, but an immediate response by the public is not needed.

- a. General Emergency
- b. Site Area Emergency
- c. Alert
- d. Unusual Event

30. If evacuation is required following a nuclear power plant accident, it is recommended that individuals living anywhere closer than miles be evacuated.

- a. 2 to 3
- b. 3 to 5
- c. 5 to 10
- d. 15

31. A detonation of a nuclear explosive above 100,000 feet of altitude is called _____.

- a. An air burst
- b. A high-altitude burst
- c. A sub-cosmic burst
- d. A surface burst

32. Nuclear explosions can be of times more powerful than the largest conventional weapon.

- a. Hundreds
- b. Thousands
- c. Millions
- d. Billions

33. The total energy released in a nuclear explosion, is the explosions:

- a. Thermal energy
- b. Blast
- c. Energy yield
- d. Nuclear energy

34. The immediate destructive action of a nuclear explosion is caused by this.
- a. Heat
 - b. Radiation
 - c. Shock
 - d. Dust
35. A nuclear explosion which releases energy equivalent to 7,000,000 tons of TNT:
- a. Is called a 7 kiloton burst
 - b. Has an energy yield of 7 kilotons
 - c. Is called a 7 megaton burst
 - d. Has a thermal energy release of 7 million kilograms
36. Just as in an emergency resulting from a nuclear power accident, the three most important ways of reducing the radiation exposure from fallout from a nuclear weapon are:
- a. Time, shelter, and gender
 - b. Dose rate, distance, and time
 - c. Dose rate, distance, and shielding
 - d. Time, distance, and shielding
37. Radioactive fallout makes the surface it comes into contact with radioactive. (True or False?)
- a. True
 - b. False
38. Radiological survey instruments:
- a. Will not be very reliable after a nuclear detonation because of weak batteries and no sure way of checking the strength of those batteries
 - b. Will give just an approximate answer which will need to be corrected using the "7: 10 Rule of Thumb"
 - c. Are the most accurate and reliable means of determining exposure levels
 - d. Will be very reliable following a nuclear detonation since they usually use AC line current
39. According to the "7:10 Rule of Thumb," if the exposure rate one hour after detonation of a nuclear weapon is 500 R/hr, the exposure rate approximately 14 days later (343 hours) will be approximately:
- a. 50 R/hr
 - b. 5 R/hr
 - c. 0.5 R/hr
 - d. 0.05 R/hr
40. The 7:10 Rule of Thumb:
- a. Is 100 percent accurate
 - b. Helps estimate future exposure levels
 - c. Is more reliable than radiological survey instrument readings
 - d. Is accurate to within +10 percent

41. Everyone is exposed to radiation on a continuing basis from either or sources.
- a. Uranium, thorium
 - b. Radon, uranium
 - c. Natural, man-made
 - d. Terrestrial, extra-terrestrial
42. Radiation that individuals are exposed to on a continuing basis which is considered non life-threatening is also known as this kind of radiation?
- a. Cosmic
 - b. Intrinsic
 - c. Background
 - d. Uneventful
43. Just under half of man's exposure to external natural radiation comes from?
- a. Radon
 - b. Cosmic radiation
 - c. Rocks
 - d. Food
44. Radon dose comes primarily from its daughter products which are ?
- a. Ingested
 - b. Counted
 - c. Inhaled
 - d. Touched
45. The two radionuclides which concentrate in seafood are:
- a. Lead and mercury
 - b. Thorium and mercury
 - c. Lead and polonium
 - d. Polonium and mercury
46. By far, the radionuclide used in most nuclear medicine procedures is:
- a. Carbon-14
 - b. Strontium-90
 - c. Technicium-99m
 - d. Cobalt-60

47. Nuclear medicine techniques work through the detection of this kind of radiation, injected into the body by adding a radioisotope to a certain drug:

- a. Alpha particles
- b. X-rays
- c. Gamma-rays
- d. Neutrons

48. Cancerous tumor cells can be treated by high energy or

_____.

- a. Neutrons, alpha particles
- b. Neutrons, electrons
- c. Gamma rays, X-rays
- d. Gamma rays, neutrons

49. Most debris from a nuclear weapons test:

- a. Fell immediately
- b. Was pushed into the troposphere
- c. Was pushed into the stratosphere
- d. Disintegrated

50. Many smoke detectors contain:

- a. Americium-241
- b. Carbon-14
- c. Strontium-90
- d. Iodine